INDEX TO VOLUME 19

1977

Index to Authors and Contributors

ADLER, D., *Paper* Calculation of the blade-to-blade compressible flow field in turbo impellers using the finite-element method, 108
AL-ASTRABADI, F. R., *Paper* Thermal resistances of stacks of thin layers under compression, 167
ALEXANDROV, V. A., *Paper* Analysis of a journal bearing with self-boosted pressure generation, 58
AL-HASSANI, S. T. S., *Paper* Large-deflection response of square frames to concentrated impulsive loads, 243

BALZER, L. A., *Paper* Atmospheric turbulence encountered by high-speed ground transport vehicles, 227
BANKS, W. M., *Paper* The nonlinear behaviour of thin, orthotropic, curved panels under lateral loading, 30
BELEK, H. T., *Paper* Free vibration of blade packets, 13
BILIMORIA, E. D., *Paper* Heat transfer in rotating cylindrical cavities, 175
BROOKS, B. E., *Paper* The roles of skirt planform and deflection in hovercraft response, 1
BROWN, S. R., *Paper* The partially lubricated piston ring, 81
BURNSIDE, B. M., *Research Note* Temperature-entropy diagrams of the immiscible liquid binary cycle, 131
BURROWS, C. R., *Paper* Dynamic characteristics of a pneumatic flapper valve, 113

CHISHOLM, D., *Research Note* Two-phase flow through sharp-edged orifices, 128
CITAVY, J., *Paper* The effect of Reynolds number and turbulence intensity on the performance of a compressor cascade with prescribed velocity distribution, 93
CROLL, S. G., *Communication* The distortion and buckling of long viscoelastic cylinders in pure bending, 133

DANESHI, G. H., *Paper* The significance of the isotropic hardening rule in relation to the stress–strain curves of a pre-strained metal, 157
DONE, G. T. S., *Paper* Dynamic instability of certain conservative and non-conservative systems, 251
DUNCAN, J. L., *Paper* In-plane torsion testing of sheet metal, 213

ETTLES, C. M. M., *Paper* Analysis of a journal bearing with self-boosted pressure generation, 58

FRENCH, M. J., *Research Note* Hydrodynamic basis of wave-energy converters of channel form, 90
FUNG, W. S., *Paper* Interferometric study of the temperature field created by a quasi-plane cold air jet and an adjacent flat plate, 47

GOHAR, R., *Paper* Oil-film starvation in elastohydrodynamic circular contacts, 22
GURNANI, C. K. S. *Paper* Pressure-distribution measurements in rotary forging, 135

HAMILTON, G. M., *Paper* The partially lubricated piston ring, 81
HAMMOND, G. P., *Paper* Interferometric study of the temperature field created by a quasi-plane cold air jet and an adjacent flat plate, 47
HART, J. A., *Corrigendum to Communication*, 45
HASHMI, M. S. J., *Paper* Large-deflection response of square frames to concentrated impulsive loads, 243
HAWKYARD, J. B., *Paper* Pressure-distribution measurements in rotary forging, 135
HEDAYA, M. T., *Paper* An analysis of a new type of automatic balancer, 221
HOLMES, R., *Paper* The damping characteristics of vibration isolators used in gas turbines, 271
HOOKE, C. J., *Papers* Non-Hertzian elastohydrodynamic contacts: an experimental investigation, 189; The elastohydrodynamic lubrication of heavily loaded contacts, 149

HUNT, J. B., *Research Note* Reduction in relaxation oscillation (stick-slip) amplitudes by normal excitation, 42

JOHNSON, W., *Paper* Pressure-distribution measurements in rotary forging, 135
JONES, A. M., *Paper* Thermal resistances of stacks of thin layers under compression, 167
JONES, C. D., *Paper* 'Wavy' modes of instability in the flow between eccentric rotating cylinders, 76

KOTAS, T. J., *Research Note* Streamline pattern in a confined vortex flow, 38
KRIMERMAN, Y., *Paper* Calculation of the blade-to-blade compressible flow field in turbo impellers using the finite-element method, 108

MARKHO, P. H., *Paper* 'Wavy' modes of instability in the flow between eccentric rotating cylinders, 76
MARSHALL, I. H., *Paper* The nonlinear behaviour of thin, orthotropic, curved panels under lateral loading, 30
McGEOUGH, J. A., *Paper* Analysis of electroforming with direct current, 163
MOBBS, F. R., *Paper* 'Wavy' modes of instability in the flow between eccentric rotating cylinders, 76

NEVRALA, D. J., *Paper* Modelling of air movements in rooms, 264
NORBURY, J. F., *Paper* The effect of Reynolds number and turbulence intensity on the performance of a compressor cascade with prescribed velocity distribution, 93

O'CALLAGHAN, P. W., *Papers* Interferometric study of the temperature field created by a quasi-plane cold air jet and an adjacent flat plate, 47; Microtopographic influence of nominally flat metallic surfaces upon their thermally reflective behaviour, 65; Thermal resistances of stacks of thin layers under compression, 167
OWEN, J. M., *Paper* Heat transfer in rotating cylindrical cavities, 175

PECKHAM, R. G., *Paper* Dynamic characteristics of a pneumatic flapper valve, 113
POWER, E. M., *Paper* A technique for accelerating block load fatigue programmes, 193
PROBERT, S. D., *Papers* Interferometric study of the temperature field created by a quasi-plane cold air jet and an adjacent flat plate, 47; Microtopographic influence of nominally flat metallic surfaces upon their thermally reflective behaviour, 65; Modelling of air movements in rooms, 264; Thermal resistances of stacks of thin layers under compression, 167

RASMUSSEN, H., *Paper* Analysis of electroforming with direct current, 163
REYNOLDS, A. J., *Paper* The roles of skirt planform and deflection in hovercraft response, 1
RHODES, J., *Paper* The nonlinear behaviour of thin, orthotropic, curved panels under lateral loading, 30

SAITOH, T., *Paper* Numerical solution for the spherical bubble growth problem in a uniformly ultraheated liquid, 101
SATTER, M. A., *Paper* Analysis for improved design of an oil cushion, 143
SHARP, R. S., *Paper* An analysis of a new type of automatic balancer, 221
SHIMA, A., *Paper* Numerical solution for the spherical bubble growth problem in a uniformly ultraheated liquid, 101
SIMPSON, A., *Paper* Dynamic instability of certain conservative and non-conservative systems, 251
SOWERBY, R., *Paper* In-plane torsion testing of sheet metal, 213

TAYLOR, R., *Paper* A numerical solution of the dynamic characteristics of an aerostatic, porous thrust bearing having a uniform film subjected to linear axial load variations, 122

THOMAS, J., *Paper* Free vibration of blade packets, 13
TOMITA, Y., *Paper* In-plane torsion testing of sheet metal, 213
TULLY, N., *Research Note* The downstream influence of inertia on simple gas bearing element performance, 278

VAKILZADEH, A., *Paper* Oil-film starvation in elastohydrodynamic circular contacts, 22
VARNAM, C. J., *Paper* Non-Hertzian elastohydrodynamic contacts: an experimental investigation, 189

WATSON, A. R., *Communication* The distortion and buckling of long viscoelastic cylinders in pure bending, 133
WILLIAMS, D. J., *Paper* Waterhammer in non-rigid pipes: precursor waves and mechanical damping, 237
WILLIAMS, J. A., *Paper* The action of lubricants in metal cutting, 202

Subject Index

Titles of papers are in capital letters

ACTION OF LUBRICANTS IN METAL CUTTING, 202
Air-conditioning systems, 47, 264
Air flows in rooms
  modelling of, 264
  modified-nozzle scale-factor method, 268
  new possibilities for modelling, 268
  replacing convective current by wall jet, 268
  turbulent conditions, 267
ANALYSIS FOR IMPROVED DESIGN OF AN OIL CUSHION, 143
ANALYSIS OF A JOURNAL BEARING WITH SELF-BOOSTED PRESSURE GENERATION, 58
ANALYSIS OF A NEW TYPE OF AUTOMATIC BALANCER, 221
ANALYSIS OF ELECTROFORMING WITH DIRECT CURRENT, 163
ATMOSPHERIC TURBULENCE ENCOUNTERED BY HIGH-SPEED GROUND TRANSPORT VEHICLES, 227
Automatic balancer, 221

Balancer, automatic, 221
Bearing element, parallel-flow, orifice-compensated, 278
Bearings
  gas, film-choking effect on performance, 278
  journal, squeeze film, 271
  journal, with self-boosted pressure generation, 58
  squeeze-film, 271
  thrust, aerostatic, porous, dynamic characteristics of, 122
  thrust, oil-film starvation in, 26
Bending, buckling of cylinders in, 133
Blade packet vibration, 13
  frequency inference diagram for, 16, 20
Blade-to-blade compressible flow field in turbo impellers, 108
Bubble growth (or collapse) problem in ultraheated liquid, 101
Buckling of cylinders in bending, 133
  see also Snap-buckling

CALCULATION OF THE BLADE-TO-BLADE COMPRESSIBLE FLOW FIELD IN TURBO IMPELLERS USING THE FINITE-ELEMENT METHOD, 108
Cavities, rotating cylindrical, heat transfer in, 175
Chilowsky effect, 47
Coanda effect, 47
Compression, thermal resistances of stacks on thin layers under, 167
Compressor cascade, with prescribed velocity distribution, 93
Conservative and non-conservative systems, 251
Cutting fluids, effectiveness of, 202
Cylinders
  distortion and buckling in bending, 133
  flow stability between eccentric rotating, 76

DAMPING CHARACTERISTICS OF VIBRATION ISOLATORS USED IN GAS TURBINES, 271
DISTORTION AND BUCKLING OF LONG VISCOELASTIC CYLINDERS IN PURE BENDING, *Communication*, 133
DOWNSTREAM INFLUENCE OF INERTIA ON SIMPLE GAS BEARING ELEMENT PERFORMANCE, *Research Note*, 278
DYNAMIC CHARACTERISTICS OF A PNEUMATIC FLAPPER VALVE, 113
DYNAMIC INSTABILITY OF CERTAIN CONSERVATIVE AND NON-CONSERVATIVE SYSTEMS, 251
Dynamic systems, conservative and non-conservative, 251

EFFECT OF REYNOLDS NUMBER AND TURBULENCE INTENSITY ON THE PERFORMANCE OF A COMPRESSOR CASCADE WITH PRESCRIBED VELOCITY DISTRIBUTION, 93
Elastic-plastic responses of frames under impulsive loads, 243
Elastohydrodynamic circular contacts, oil-film starvation in, 22
Elastohydrodynamic contacts, non-Hertzian, 189
ELASTOHYDRODYNAMIC LUBRICATION OF HEAVILY LOADED CONTACTS, 149
Electroforming with direct current, 163
Energy forms in fixed and moving frames, 263
Energy from sea-waves, 90

Fatigue, block load programmes, 193
Finite-difference method
  large-deflection response of square frames, 244
  spherical bubble growth, 103
Finite-element method
  blade-to-blade stream surface of turbo impellers, 108
  in-plane torsion testing of sheet metal, 216
  vibration of blade packets, 13
Flapper-nozzle valve, pneumatic, 113
Flexural waves in waterhammer in non-rigid pipes, 237
Flow patterns
  air flows in rooms, 264
  streamline pattern in confined vortex flow, 38
Flow stability between eccentric rotating cylinders, 76
Flow through orifices, 128
Flow visualization
  for confined vortex flow, 39
  on rotating cylindrical cavities, 180
Fluid dynamics measurements, rotating cylindrical cavities, 180
Fluid velocity measurements, optical technique and apparatus for, 39
Forging, rotary, of discs, 135
Frames
  energy forms in fixed and moving, 263
  portal and free square, under impulsive loads, 243
FREE VIBRATION OF BLADE PACKETS, 13
Frequency inference diagram for blade packet vibration, 16, 20
Friction conditions in metal cutting, 203
Friction velocity, 234

Gas bearings, film-choking effect on performance, 278
Gas-turbine vibration isolator, damping performance of, 271
Gaussian block programme tests, 196

HEAT TRANSFER IN ROTATING CYLINDRICAL CAVITIES, 175
Helicopter ground resonance
  energy input mechanism, 257
  equations of motion, 255
High-speed ground transportation, 227
Hovercraft, tracked, 233

Hovercraft response
comparison of craft of differing sizes, 6
comparison of models with and without skirt dynamics, 9
comparison of square-bowed and hexagonal-bowed models, 8
determination of derivatives with respect to displacements, velocities and wave excitation, 10
roles of skirt planform and deflection, 1
skirt-dynamics derivatives for particular kind of vertical deflection, 11
specification of escape areas and compartment volumes for hexagonal-bowed craft, 11
wave forcing in, 4
HYDRODYNAMIC BASIS OF WAVE-ENERGY CONVERTERS OF CHANNEL FORM, *Research Note*, 90

Immiscible liquid binary cycle, 131
Impulsive loads, elastic-plastic responses of frames under, 243
IN-PLANE TORSION TESTING OF SHEET METAL, 213
INTERFEROMETRIC STUDY OF THE TEMPERATURE FIELD CREATED BY A QUASI-PLANE COLD AIR JET AND AN ADJACENT FLAT PLATE, 47
Isotropic hardening rule, 157

Jets, quasi-plane cold air and adjacent flat plate, temperature field created by, 47
Journal bearings
squeeze-film, 271
with self-boosted pressure generation, 58

LARGE-DEFLECTION RESPONSE OF SQUARE FRAMES TO CONCENTRATED IMPULSIVE LOADS, 243
Laser Doppler anemometry, 180
Lubricant film thickness
as function of inlet distance, 24
in heavily loaded non-Hertzian contact, 189
Lubricants in metal cutting, 202
Knudsen flow, 208
penetration of, 206
viscous flow, 208
Lubricants, liquid phase, 207
Lubrication
elastohydrodynamic, of heavily loaded contacts, 149
of piston rings, 81
oil-film starvation in elastohydrodynamic circular contacts, 22
vapour phase, 207

Mechanical damping in waterhammer in non-rigid pipes, 237
Membrane stress in thin, orthotropic, curved panels, 34
Metal cutting
and friction, theory, 203
lubricants in, 202
Knudsen flow, 208
penetration of, 206
viscous flow, 208
rake-face shear stress distribution in, 205
single asperity contact, 204
MICROTOPOGRAPHIC INFLUENCE OF NOMINALLY FLAT METALLIC SURFACES UPON THEIR THERMALLY REFLECTIVE BEHAVIOUR, 65
MODELLING OF AIR MOVEMENTS IN ROOMS, 264
Modelling theory, air movement in rooms, 265

NON-HERTZIAN ELASTOHYDRODYNAMIC CONTACTS: AN EXPERIMENTAL INVESTIGATION, 189
NONLINEAR BEHAVIOUR OF THIN, ORTHOTROPIC, CURVED PANELS UNDER LATERAL LOADING, 30
NUMERICAL SOLUTION FOR THE SPHERICAL BUBBLE GROWTH PROBLEM IN A UNIFORMLY ULTRA-HEATED LIQUID, 101
NUMERICAL SOLUTION OF THE DYNAMIC CHARACTERISTICS OF AN AEROSTATIC, POROUS THRUST BEARING HAVING A UNIFORM FILM SUBJECTED TO LINEAR AXIAL LOAD VARIATIONS, 122
Nusselt numbers for heated disc of rotating cylindrical cavity, 175

Oil cushion, improved design of, 143
OIL-FILM STARVATION IN ELASTOHYDRODYNAMIC CIRCULAR CONTACTS, 22
Orifices, flow through, 128
Oscillation, stick-slip, in slider-slideway system, 42

Paidoussis flutter, binary example of, 260
Paidoussis flutter analysis, 262
Panels, snap-buckling behaviour of thin, orthotropic spherically curved, 30
PARTIALLY LUBRICATED PISTON RING, 81
Pipes, waterhammer in non-rigid, 237
Piston rings
lubrication of, 81
oil sharing between two, 84
Pneumatic flapper-nozzle valve, 113
Precursor waves in waterhammer in non-rigid pipes, 237
PRESSURE-DISTRIBUTION MEASUREMENTS IN ROTARY FORGING, 135
Pressure generation, self-boosted, journal bearing with, 58
Pre-stained metal, stress-strain curves of, 157

Recirculating flow equations, 177
REDUCTION IN RELAXATION OSCILLATION (STICK-SLIP) AMPLITUDES BY NORMAL EXCITATION, *Research Note*, 42
Reynolds number, effect on compressor cascade performance, 93
ROLES OF SKIRT PLANFORM AND DEFLECTION IN HOVERCRAFT RESPONSE, 1
Rooms, air flows in
modelling of, 264
modified-nozzle scale-factor method, 268
new possibilities for modelling, 268
replacing convective current by wall jet, 268
turbulent conditions, 267
Rotary forging of discs, 135
Rotating cylindrical cavities, heat transfer in, 175

Sea-waves, energy from, 90
Separation bubble, length estimation of, 95
Shaft whirling system, 253
Shear stress, rake face, in metal cutting, 205
Sheet metal, 'in-plane' torsion testing of, 213
SIGNIFICANCE OF THE ISOTROPIC HARDENING RULE IN RELATION TO THE STRESS-STRAIN CURVES OF A PRE-STRAINED METAL, 157
Slider-slideway system, stick-slip oscillation in, 42
Snap-buckling behaviour of thin, orthotropic, spherically curved panels, 30
Stacks of thin layers under compression, thermal resistance of, 167
Stick-slip oscillation in slider-sideway system, 42
STREAMLINE PATTERN IN A CONFINED VORTEX FLOW, *Research Note*, 38
Stress-strain curves of pre-strained metal, 157
Surface reflectivity, microtopographic influence on, 65

Taylor number, and flow between eccentric rotating cylinder, 76
Taylor-vortex flow, 76
'Teapot effect', 47
TECHNIQUE FOR ACCELERATING BLOCK LOAD FATIGUE PROGRAMMES, 193
TEMPERATURE-ENTROPY DIAGRAMS OF THE IMMISCIBLE LIQUID BINARY CYCLE, *Research Note*, 131
Temperature field created by quasi-plane cold air jet and adjacent flat plate, 47
Thermal boundary layer thickness, estimation of, 103
Thermal reflectivity of nominally flat metallic surfaces, 65
THERMAL RESISTANCES OF STACKS OF THIN LAYERS UNDER COMPRESSION, 167
Thrust bearings
aerostatic, porous, dynamic characteristics of, 122
oil-film starvation in, 26
Torque relationships of pneumatic flapper valve, 115
Torsion testing of sheet metal, 'in-plane', 213

Tubes
clamped-clamped, 260
clamped-free, 258
clamped-pinned, 260
flexible, conveying fluid, dynamics of, 258
Turbo impellers, blade-to-blade compressible flow field in, 108
Turbulence, atmospheric, 227
Turbulence intensity, effect on compressor cascade performance, 93
TWO-PHASE FLOW THROUGH SHARP-EDGED ORIFICES, *Research Note*, 128

Vibration isolator, gas-turbine, damping performance of, 271
Vibration of blade packets, 13
Virtual work principle, 216

WATERHAMMER IN NON-RIGID PIPES: PRE-CURSOR WAVES AND MECHANICAL DAMPING, 237
Wave-energy converters of channel form, 90
Wave forcing in hovercraft response, 4
'WAVY' MODES OF INSTABILITY IN THE FLOW BETWEEN ECCENTRIC ROTATING CYLINDERS, 76
Wind, velocity components of, 227
Wind forces, spectral density of, 231

Yield and yield surface, 157